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ACCESSIONS TO MAP-ROOM SINCE THE LAST MEETING OF DECEMBER 13TH, 1869.—A Map of the North-West part of North America ceded to the United States by Russia, and now called Alaska. Presented by A. Petermann. A Map of Western Australia, showing the discoveries of J. Forrest. Presented by A. Petermann. Isthmus of Suez—on two sheets. Presented by J. Wyld, F.R.G.S. Several copies for distribution. Map of the Railways around London. By M. Vigers. Presented by the author.

The business of the evening was the reception of the Report of the Society's envoy, Lord Houghton, concerning his visit to the opening of the Suez Canal. In introducing his Lordship, the President thus addressed the Meeting:—

"GENTLEMEN,—When preparations were being made to inaugurate the opening of the Suez Canal, the enlightened Ruler of Egypt, who is one of our Honorary Members, did me the honour of inviting me through his Minister, Nubar Pasha, to attend that grand and most important international ceremony.

"Feeling unable, from the uncertain state of my health, to avail myself of this great privilege, I deemed it to be incumbent on me to have the Royal Geographical Society well represented. For, independently of congratulations on the accomplishment of so vast an undertaking, I felt most anxious to testify to the Khedive the deep sense of my associates and myself of the great services he was about to render to geographical science by the confidence His Highness reposed in our friend Sir Samuel Baker, and the liberality and generosity with which he had enabled that successful traveller to endeavour to open out and make known to us the true physical geography of large portions of Inner Africa, which, notwithstanding the efforts of Livingstone, Burton, Speke, Grant, Baker, and others, still remained undefined.

"I therefore induced my friend Lord Houghton, who, as one of the Trustees, is a permanent Member of the Council, to undertake this duty and act as the representative of our body, which he did with cordiality; and I doubt not, that with his well-known eloquence, his Lordship has conveyed to the Ruler of Egypt a full recognition of our obligations to His Highness, accompanied with our hearty wish for the success of his great international enterprise. I now call on Lord Houghton to address the Meeting."

LORD HOUGHTON spoke as follows:—"When the proposal was made to me that, as Trustee of the Royal Geographical Society, it would be convenient and appropriate that I should go to this great festivity to represent that distinguished Corporation, I, being no wise unwilling, and not prevented by any accidental circumstance, thought it my duty to do so. I proceeded, as no doubt many other persons did, under the good organisation of the Peninsular and Oriental Company, and I am bound to say that everything which that important Company did, both for the comfort of the passengers to Egypt and for the establishment of their own character in Egypt, was all that could be desired by this Society and by this country. When I was asked to give you an account of my visit, I felt that it was a very different question. If I had arrived in England immediately after the opening of the Suez Canal I have no doubt—I say it without diffidence—that,

from all the information I acquired, from all the advantages I had, I should have been able to give you a novel and somewhat interesting lecture; but after your thirst for information has been satiated by the ability of the correspondents of every newspaper both in France and in England, and your intelligence has been satisfied by the reports which have been made to the Admiralty and to the Royal Society on all the scientific points of the matter, I feel I should be doing a graceless task if I were now to inflict upon you an essay on the Suez Canal. You have read so much upon the subject, you know it so well yourselves, that it is only in deference, in loyalty I may say, to our excellent President, that I appear here to-day to offer you a few desultory remarks upon any matters which it seems to me have not been sufficiently brought forward or prominently stated in the public journals, added to any little matter of private experience which I think may entertain you.

“Now, what is this Canal through the Isthmus of Suez? After having read so much about it, having heard so much about it, having seen the thing stated in moderate language in English journals, in immoderate language in French journals, I am inclined to think that its geographical, its commercial, and its political importance have been somewhat overstated. I have seen it compared to the discovery of America, in fact I have seen it placed above the discovery of America, because it has been said that to unite two worlds was a finer thing than to discover one. I cannot agree with that sentiment, nor do I think that its consequences can even be compared to those of the circumnavigation of the Cape by the great Portuguese navigator. Nevertheless it has its historical value, and I think we are doing it rather an injury than a benefit by exaggerating its importance. It is impossible to look at the map suspended on the wall of this room, to think of the relations between those two countries—two worlds—and, above all, to consider what was the power, the magnitude, the intellectual worth of ancient Egypt, without feeling that if it had been the desire of any generation previous to our own to make that Canal, it would have been made. I always think that upon the question of invention we are much inclined to forget that there are two parties in the case, the inventor and those for whom a thing is invented. With regard to the most remarkable invention in the history of the world, that of printing, we see that the impression of certain blocks went on for generation after generation, and we may well believe that the small change from fixed to movable types must have suggested itself to various minds in different countries, and yet the invention did not occur until that par-

ticular moment when movable types were wanted, when people wanted to read books. We see the same thing in medical science. We know that anæsthetics were discovered in the 13th century in Italy: for some forty or fifty years all the advantages we now derive from chloroform were enjoyed by the people of Florence, and yet that knowledge was allowed to expire through the superstition and the unfitness of the people to comprehend the invention. Thus the Suez Canal is really the product of the wants and desires of our own times, which can appreciate and apply its utility. The communication between the Red Sea and the Mediterranean might have been made just as easily as the great works of irrigation that have been made in Egypt through all the ages of the Pharaohs down to the times of the Ptolemies. That people, most apt for mechanical purposes, capable of an amount of human labour that could raise the Pyramids, do not you think, if it had been desirable, that they could have made the Canal? But the inhospitality of those days, and their abhorrence of free commerce, made it impossible for any authority to wish for such an intrusion into the Kingdom of Egypt as would have been produced by a Suez Canal. It was nobody's interest to divide Africa from Asia. Any Egyptian governor from the time of the Pharaohs, through the Romans and almost down to our time, would have believed that such a section of Egypt as has been produced by this present Canal would have caused not only an unjustifiable and unnecessary invasion of foreigners into their country, but the destruction of the nationality and integrity of Egypt. All the canals which were made in those times were communications between the Nile and the Red Sea, and not attempts to any extent, as far as we can the least discover, to make free communication between the Red Sea and the Mediterranean. Therefore I believe that it is not the difficulty of the work, or in any degree the peculiarity of the work, which has deferred it to so late a period; but that in the fulness of time, when that work has become commodious and advantageous for the interests of the world, it has been perfected.

“The present circumstances under which the work has been accomplished are these. The French tell you that Napoleon I. was the author of the Suez Canal. Of course it is probable that they should say Napoleon I. was the author of anything great, and I have no doubt that through the mind of that wonderful man this notion passed, like a myriad other notions, some of which remained, while others fitted away. But the credit, as far as France is concerned, of the Suez Canal, is mainly due to a very peculiar man, of the name of *Enfantin*, who combined, to an extent which

we Englishmen can, perhaps, hardly conceive, an extravagance of social speculation with a great amount of practical sagacity. He was the father and founder of the Saint-Simonian religion. When, in 1833, Père Enfantin came out of prison, into which he had been cast for some infraction of the laws of his time, he went to Egypt, and took with him several persons of his own peculiar sect, who were devoted to him, and to whom he confided that the great object of his life was a Canal between the Red Sea and the Mediterranean. He found in Egypt at that time a Vice-Consul of the name of M. Ferdinand Lesseps, whom he interested in the work. He found also in Mahomet Ali, the Governor of Egypt, a most original and vigorous man, who received with very great willingness all the notions of Enfantin respecting the Suez Canal. But at that time Mahomet Ali had another project in his head, which was the great Barrage of the Nile; and for several months it remained quite uncertain to which great work he would give his, so to say, royal patronage. At last, unfortunately for M. Enfantin, it was decided in favour of the Barrage. Nevertheless, he remained in Egypt for some time, and made inquiries as to the possibility of the enterprise. He took surveys of a very interesting character, and after three years, during which time a great number of his friends had been cut off by the plague, he returned to Europe. Very little more was heard about this enterprise until the year 1845, when, as you know, there was a great commercial excitement in Europe about railways and intercommunication of all kinds. At that time he started the project, and in 1846 established in France the *Société d'études du Canal de Suez*,—a society of persons who were to study the practicability of making this canal. Looking over the names of the persons who composed this Society, one of the first I find is that of Mr. Robert Stephenson, the English engineer. Soon after came the revolution of 1848, and the commercial difficulties connected with it; but, when affairs were at all quiet in France, Père Enfantin was again at his work, and, taking advantage of a mission of M. de Lesseps to Said Pasha in 1854, he organised a series of inquiries into the best methods of making this canal, and one of the chief personages connected with those inquiries was Mr. Robert Stephenson.

Now, having gone through the Canal of Suez, I have at least learnt one lesson—not to go out of my depth; and, therefore, upon all engineering and purely scientific matters I shall be either entirely silent, or request any persons who are here who understand them much better—some of whom have been my fellow-travellers—to state their opinions; but I may say this, that the result of the inquiries of Mr. Robert Stephenson, and those who were with him,

was entirely unfavourable to the enterprise of the Suez Canal. That impression Mr. Robert Stephenson brought to England, and at the same time brought before the public in the strongest manner the advantage of having a railroad through Egypt, and threw himself with great energy into the project. That railroad was in a short time completed. Now, the railroad between Alexandria and Suez having been made, you will quite see that a great many of the approximate advantages of the canal would almost disappear. We had almost as rapid and good a communication as we could wish to have, and therefore the public interest and public excitement in the canal was very much diminished by the mere fact of our having an efficient railroad; so that when M. de Lesseps, notwithstanding the discouragement of Mr. Robert Stephenson's unfavourable report and the coincident opinion of many of the leading engineers of Europe, undertook that work—the system of Egyptian railroads being already made, or in making—we must all of us own that there must have been an admirable energy in the mind of that man.

“M. de Lesseps has not invented the Suez Canal. It is the result of the thoughts, the deductions of many other men, but he is, as it were, the complement of them all.

“Now I will pass from this point to the personal circumstances under which I found myself, as the representative of the Royal Geographical Society, at Port Said some two months ago. We went from Europe to Egypt a small body, as far as the English were concerned, of the guests invited by the Khedive. I doubt whether there were fifty, of all who had been invited; I doubt whether fifty more English came who were not invited, so that, as far as England was concerned, we were sparsely but I think respectably represented. It was not the same with the nations of the Continent. France took her full advantage, and from the mere fact of this matter having been in so great degree a French enterprise, I do not say it was any way unjust that she should have done so. The English element was mainly composed of representatives of important Societies; though some—for instance, the British Museum—did not choose to be represented, and would not—I never understood why—allow its representatives to go. The Royal Society was represented most fitly by Mr. Bateman, the well-known engineer, who delivered, only a few days ago, an interesting lecture upon this subject before the Royal Society. There were also correspondents, some men of high literary pretensions, representing the principal English Journals. But the French and the Germans came in large bodies, and we English were merged in the multitude.

In fact, it was a great Excursion-Train from Europe to Africa. That is the only fair description which can be given of it, and in an excursion train, you know, it is very difficult to distinguish anybody, so that on the whole I am rather glad that our excellent President did not go himself, but made me his substitute. For, what with that lovely and enterprising lady the Empress of the French, with the Emperor of Austria, who charmed everybody by the simplicity of his demeanour and the intelligent interest he took in all matters connected with the canal, with our own connection the Crown Prince of Prussia, and a great many other royalties, I could not help feeling that even our illustrious President might have been submitted to the ordinary confusion and discomforts of a crowd. Now there was the best intention on the part of the Egyptian Government. The magnificence of the entertainments, and the amount of money that was spent was something fabulous, and, whatever failed, everybody felt that any inconvenience they were put to really came from the accidents, the inevitable circumstances, and in no way whatever from the complicity of the Government by which they were entertained. There was one unfortunate event, of which I have no difficulty in speaking, because it was one of which Nubar Pasha, the Foreign Minister of the Khedive,—a most gracious and intelligent gentleman, for whom everybody, who is acquainted with him, has the greatest esteem,—went to the extravagant length of saying, ‘ You may forgive me for this blunder, but I never can forgive myself.’ It seems to me that he was not in the least guilty. The circumstance was this. I mentioned that I went to Alexandria under the guidance of the Peninsular and Oriental Company. But at Alexandria the guests were placed in large and luxurious Egyptian steamers, many of them the private yachts of the Khedive, and conveyed to Port Said for the purpose of being taken through the Suez Canal. At Port Said the ceremonies connected with the opening were of the greatest interest. It was there took place that religious function of which you have seen so many reports, where the Moslem priests in a simple and noble manner called for the benediction of God upon this great enterprise. That was followed by a ceremonial performed with all the pomp of the Romish worship, and a dignified discourse by a French prelate. On the evening of that day M. de Lesseps came to Nubar Pasha and told him that, to his great grief, he had come to the conclusion that none of the large Egyptian vessels could securely pass through the canal. Now these large Egyptian vessels contained all the guests of the Pasha, and therefore what was to become of them? Such as could find any private

refuge did so; the rest were put into smaller vessels and taken to Ismailia, where they were placed in tents, and taken care of until their return to Cairo. I have never been able to explain to myself why this resolution was taken so late. It produced an enormous amount of individual discomfort, and, so far as I could see, there was no reason whatever why the same resolution should not have been come to some days before, and arrangements made accordingly. As it was, that was the one great inconvenience to which the guests of the Pasha were submitted. When they were at Ismailia they found comfort, almost luxury. For my own part, and on the part of those who were with me, I can only say that we found perfect hospitality in the English vessels which were there. Lord Dudley and his party went on board Mr. Talbot's yacht the *Lynx*, and I was kindly received by Mr. Elliot and Mr. Pender in the *Hawk*, which had been purchased by the latter enterprising pioneer of commercial intercourse, for the purposes of the Electric Telegraph Maintenance Company, and in which I had the very great advantage of going through the canal in the company of Mr. Hawkshaw and Mr. Bateman, the two illustrious engineers.

"At Port Said I saw M. de Lesseps. The only connection I remembered between the Royal Geographical Society and the Suez Canal was the lecture of Captain Pim, which was delivered on the 11th April, 1859, and the effect of which was to bring to bear, both in the lecture itself and in the discussion which followed, the impression upon the Society of the impracticability of the Suez Canal. Therefore I was not sorry that M. de Lesseps recognised me as an individual and not purely as the representative of this Society, and I was somewhat flattered when he came up to me and said, 'I remember you; you were one of our English friends when our friends were few.' I then recalled to mind that at the time M. de Lesseps had come here, and had been somewhat ill received by the commercial classes and the political opinion of this country, I expressed to him my full belief that he would succeed in his enterprise.

"Here perhaps you will allow me to say a word for a friend of mine who is now passed away, and whose opposition to the Suez Canal has been made a subject of much criticism, even of censure—I allude to Lord Palmerston. I first met M. de Lesseps at Lord Palmerston's house, and at the time a great illwill was excited in certain circles in France by the notion that Lord Palmerston had exercised an almost undue political influence in opposing the Suez Canal. There were persons, however, and among others myself, who ven-

tured to differ from Lord Palmerston, and I thought it was perfectly useless whether we opposed the Suez Canal or not, for that the French were determined to make it, and that if the French and the Egyptian Governments were once agreed, the canal would be made, whether we liked it or no. But there is a point which I should be very glad to see put upon record, which is, that the project which Lord Palmerston opposed was not the project which has now been carried out. The project to which Lord Palmerston gave his political opposition was the arrangement between M. de Lesseps and Said Pasha, the effect of which would have been to transfer to a French Company, and through that French Company at any time to the French Government, the possession of a large province of Egypt which was to be irrigated by a fresh-water canal in conjunction with that across the Isthmus. Lord Palmerston took the ground that it was not necessary for the purposes of the ship-canal, nor in any degree a necessary part of the commercial enterprise, that a French Company should possess a whole province of Egypt. That representation was made by Lord Palmerston so distinctly and so powerfully at Constantinople, that a new arrangement was entered into of a totally different nature. Compensation was given to the Company by the Pasha for the possession of the land, and therefore at this present moment the Company only possess the canal itself, and certain portions of the banks connected with it, which, considering the sacrifices they have made, I am bound to say they are fully entitled to. I must admit that Lord Palmerston's political opposition to the Suez Canal was hardly in consonance with the general moderation of his policy, because it was one of those events which, as I have already stated, I believed would come about naturally in the fulness of time under any political circumstances whatever.

“Well, so we started from Port Said. A striking moment it was, and to my mind on looking back to my impressions, it is the grandest of the whole. I see here persons who were present with me at that moment, and I think I might appeal to them whether the entrance of that quiet and solemn procession of ships into the desert, in that beautiful bright Egyptian morning, was not a spectacle they can hardly forget? After the cannons, the fireworks, and all the tumult of the preceding day, there they went on, vessel after vessel, at no great distance from one another, each watching the preceding one with the intensest interest, with the knowledge that any one might stop the way and so break all the charm. And so the whole of that day we traversed the silent desert. I do not know whether it was done on purpose, with that sense of art

which the French so curiously exemplify in all their great manifestations, but every sign of life seemed to be withdrawn from the banks. There was not a dwelling, there was hardly a wandering Arab. In this place, which had been the sepulchre of so many lives—which had been the hive of humanity for the last ten years—there was a perfect, desolate, stillness. On went the vessels through the marsh, through the sand, as it were new animals invading that solitude till we arrived at Lake Timseh. I told you I had the advantage of accompanying Mr. Bateman and Mr. Hawkshaw, and therefore I may say that I got to know the canal thoroughly well, because we sounded every step that we went along, and through the whole of those three days we never—as far as I remember—sounded less than 18 feet.

“When Mr. Hawkshaw landed at Port Said, M. de Lesseps took him by the hand and presented him to all the engineers who were about him, and said, ‘This is the gentleman to whom I owe the canal.’ And it was literally true. At the time when the reputation of the canal was at its worst—when public opinion in Europe was growing against it—when money was the hardest to get—the Khedive asked for an English engineer who would give him a final opinion as to the practicability of the canal. He selected Mr. Hawkshaw, who is a man not only high in his profession, but of the most singular independence and simplicity of character—a man who fears nobody and nothing in the cause of scientific truth. The Khedive told Mr. Hawkshaw that if he would report to him confidentially that the canal was impracticable, he would take care that the works were brought to an end without injury to anybody. You have had before you the report of Mr. Hawkshaw. He reported that the canal was not only feasible, not only practicable, but that to his mind the main engineering difficulties which had been raised were not such in any degree as would authorise its abandonment; that he believed the canal could be made and could be maintained at a moderate and reasonable expense, and therefore, when M. de Lesseps presented Mr. Hawkshaw, as I saw him do, to the persons present at Port Said, he was thoroughly justified in saying, ‘It is to him that I mainly owe the accomplishment of this great enterprise.’

“What happened at Ismailia when we arrived there you all know very well. You have read over and over again the accounts of the festivities, and the fireworks, and the oceans of champagne, and the acres of *galantine*, and all the profuse hospitalities which we received. It is the simple fact that there must have been present in that wild locality at least 5000 Europeans, and at least 40,000 Orientals. Everybody had more to eat and drink than they could

consume, there was glorious weather, and if everybody was not contented it was entirely their own fault.

“ On looking back over the records of the engineering of the passage from Ismailia to the Red Sea, you will see that Mr. Robert Stephenson and other objectors found the chief difficulties in that part of the canal. Now, when proceeding through the first portion from Port Said to Ismailia it was evident that the banks were very friable, that from the impossibility of bringing in fresh water to bear, it was extremely difficult to produce any vegetation sufficient to consolidate them, and thus that there might be considerable difficulty in keeping it open or enlarging it; but at the same time I am bound to say that, though a strong wind was blowing the whole time, I was not conscious of the presence of any large amount of sand of any kind, or of any material which could encumber the canal. There were certainly some curves which were awkward for long vessels to pass, and which will, I have no doubt, if the canal attains its perfection, be shortened. But from Ismailia to the Red Sea, there did not seem to be, either between Ismailia and the Bitter Lakes, or between the Bitter Lakes and the Red Sea, as far as I could see, any embarrassment whatever. Yet this range included the ancient Serapeum, and here is a specimen of the rock which had cropped up almost unknown to the engineers in the middle of the canal, and for the reduction of which great labour was required up to the very last moment in which we passed it. Still, as far as I know, and I have looked out for information to the contrary, no one vessel found the slightest difficulty in passing the Serapeum, or even scraped the rock. Of course, with the engineering powers that are employed in blasting the rocks at the bottom of the canal, there is no reason why this one should not be reduced a certain amount every day, and to any given amount in a certain number of months.

“ As to the future of the canal itself, the widening of it or the deepening of it, the case is simply this, that a single line of rails has been laid down, which may be made by a certain amount of expenditure a double line any time you choose. I know it was the expressed opinion of Mr. Hawkshaw that it would not be advisable to make the canal too large. He said, if you made a canal larger than was required for two vessels to pass one another, then they would wander and get foul of one another, and there would be more danger than in a comparatively narrow canal. All that was wanted was a canal sufficiently wide for two vessels to pass. At the present moment it is not wide enough for two large vessels to pass at certain points, and that will require to be remedied. The deep-

ening and the enlarging of the canal are matters solely of expense, and I heard it said by what I consider the best authorities, that about 2,000,000*l.* sterling would be sufficient to render the canal perfectly effective for all purposes of commercial navigation.

“ You asked me, sir, to state something with regard to my presentation to the Khedive. I saw his Highness the first time at Ismailia, on board his own steam-yacht. I was introduced to him by our Ambassador, and I presented to him the compliments of this distinguished Society. I spoke of the interest we had taken in his work, and offered him our congratulations on its completion. His Highness was pleased to express his gratification and his thanks. At that moment his Highness was in a state of great excitement, because he had achieved, as he considered, a very great work, and he told us what it was. He said, ‘ Last night I had rather a hard time of it. I was very anxious, of course, that the *Aigle*, on board which was the Empress of the French, should have a perfectly free course, and so I sent a ship called the *Latiff* to clear the way. The *Latiff*, a very short time after having got into the canal, ran against the side of the canal, stopping it up altogether. The Captain of the *Latiff* sent to Port Said, and awoke me between 11 and 12 o’clock at night, upon which I got into my own little vessel and took 300 men with me, *Je faisais un peu le capitaine moi-même*, so that by 6 o’clock in the morning I had got the *Latiff* off, and soon had her shunted at one of the stations, and went on in my yacht so as to have the course clear for the *Aigle*, which was to start at 7 o’clock in the morning.’ There seemed to me something very practical and interesting in the sovereign of the country himself not only leading, but clearing the way through his own canal. He told another person that if he could not have got the *Latiff* off he should certainly have blown her up, so that the *Aigle* might have got on clear. I am not quite sure that that feat would have been successful, but at any rate it showed the Viceroy’s energy.

“ Thus we passed through the Suez Canal, testing the enterprise as we went along, enabling me on the best authority to assure you that we believe that the work is completed. And a noble work it is. I do not say that its effects, its immediate effects at any rate, will be very considerable either on the political or the commercial arrangements of the world. The canal that follows a railway cannot do much. The railway has done the thing already. The canal cannot create, it can hardly extend communication; all it can do is to facilitate the trade that exists. At the present moment the canal is perfectly open to any trade in small vessels which can be taken through the canal and the difficult passages of the Red Sea up to

Aden by steam-tugs, and then left to take their free course to India, or anywhere else they like to go to. Now the whole question is, what commerce can be developed, and will be developed, by that project? There will, I believe, be a considerable amount of small trade with Italy, Greece, and the Levant. Whatever they can do has now, no doubt, a free and most advantageous opening. The Emperor of Austria, to whom I had the honour of being presented, said to me, 'Here I represent Trieste,' and there is no doubt that all that Austria can produce will be benefited by the canal. Italy is every day growing, as you know, in intelligence, in prosperity, and in independence; all that Italy can do will gain very largely by the canal. All that Greece can do, all that the Levant can do will gain also, just in proportion, and no more than in proportion to, the trade that they can produce and encourage—in proportion to their own exports and imports. I have no doubt that will gradually become a very important intercourse, though it will be gradual; but I believe that the canal will have but very little effect upon the great commerce of England and France. In the progress of time, as the canal becomes an established and recognised mode of communication, there will be considerable convenience in the conveyance of troops, and in the ordinary intercourse between England and Bombay; but nevertheless I cannot help feeling that for many years to come neither England nor France, which has sacrificed so much upon this matter, will be any considerable gainers. It is the small commerce which will gain first. The large commerce has its markets already. I should be very glad if gentlemen who are here, who can give us information upon these subjects, would enlarge upon what I have said, whether they agree with me or contradict me.

"We came to Cairo from Suez by the railroad, which, though ordinarily well-managed, was not equal to the emergency. The organization completely broke down, and we were too thankful to find ourselves at Shepherd's Hotel.

"I had the honour of paying a farewell visit to the Khedive, accompanied by Sir Samuel Baker. It may seem ungracious, but I was very sorry to see Sir Samuel Baker when I arrived at Cairo. I had hoped that by that time he was far on his way, and that the expectation which he expressed to me on leaving London in June—of eating his Christmas dinner on the great central lake of Africa—would have been realised. But, alas! it was very near that time when I left him still at Cairo. Since then he has left it, and started on his great work. Now I suppose there is no expedition which the Royal Geographical Society has more at heart than

this great one of Sir Samuel Baker, and, in concluding with a few words concerning it, I am sure I shall be speaking on a subject which interests you all. When Sir Samuel Baker left England he had an exaggerated belief as to the interest which not only the Khedive but the Egyptian Government took in his expedition. It had been represented to him that the expedition was the great object of the whole Egyptian people, and that he would be supported in every possible way in it. When he got there he found, as I believe most persons do find when they have to do with Oriental Governments, that the work which is the desire of the Sovereign is not only not always the desire of the people, but not always the desire of his own Government. Sir Samuel Baker found that he had only the Khedive to rely upon in the matter, and that neither the people nor the Government looked with favour on his expedition. You know that the suppression of the slave-trade is one of the main results which he anticipated from his enterprise. Now, the suppression of the slave-trade in those districts beyond Egypt would have a very peculiar effect upon Egypt itself. Slavery in Egypt is by no means the ordinary predial slavery of which we are accustomed to talk, but the system supplies domestics to the households of the Egyptian people, and therefore the notion of suppressing and arresting that form of slavery is by no means agreeable generally to the people of Egypt. But Sir Samuel Baker argued, I think very conclusively, 'As long as the slavery merely consists in bringing persons down to Egypt for life-labour, without violence, that is a matter with which I do not interfere; but as long as slavery implies that all those countries contiguous to the south of Egypt are to be kept in a state of the most abominable and cruel war, and are to be subject to continual raids, for the purpose of obtaining slaves for the Egyptian market, it is impossible that those peoples can be in a position in which civilization can be introduced, or in which productive agricultural industry can be established.' You will, then, understand that, in going to those countries for the purpose of putting down the slave-trade, although he goes with the full will and desire of the Khedive, the Egyptian people do not approve of the enterprise. He is, therefore, under circumstances of peculiar difficulty, and he told me to represent to you and to all his friends here that he hoped great allowances would be made for him if he came short of your expectations, and did not accomplish at once all that you desire him to do. The Khedive offers him everything, and is profuse in the men and the money that he gives him; but, nevertheless, he does not find that assistance in the populations which he expected. He told me he had hoped to

have gone beyond Gondokoro, and established the troops he has taken with him in a sort of military colony, for the purpose of bringing into cultivation a large portion of land between Gondokoro and the lakes during the winter, but that he feared very much that, by the time he got there, he should find the rivers so swollen as to make it impossible to proceed. At any rate, we may have perfect confidence in all that can be done by the chivalry and the intelligence of Sir Samuel Baker. He has with him that remarkable lady whom we have seen the grace and ornament of polite society, and of whom we can hardly comprehend the metamorphosis into the hardy companion and most useful associate of the adventurous explorer. He has now proceeded upon his work, and we must all wish him God speed. The embarrassments which have arisen with regard to the position which he occupies in relation to the Khedive and the Sultan have by this time, I hope, been arranged; in fact, so far as I could see, the diplomatic difficulties were of no gravity whatever. Whatever he does for the aggrandisement of Egypt, is also done for the aggrandisement of the dominions of the Sultan: whatever peoples he brings into subjection to, or connection with, the Egyptian Government will be, no doubt, subjects of the Sublime Porte. The Padishah reigns over all. The Pasha of Egypt is himself, and presumes and professes to be, nothing but the Viceroy of the Sultan. Therefore I do not understand how any umbrage can be caused by any distinctions being given to Sir Samuel Baker either by the one power or the other. All I ask with regard to Sir Samuel Baker is, that you will follow his proceedings with your usual interest, that you will make every allowance for him under the difficult circumstances in which he is placed, and that you will trust in him for the future from what you know of him in the past.

"I do not know that I have anything more to do than to thank you much for the kind attention which you have given me in these casual and incidental remarks; and if you have found anything in them which can have excited any interest or called forth any suggestions, I can only thank you for having added that gratification to those which I have derived from the expedition. There are gentlemen here who could enlarge or criticise these observations to your advantage, and you will permit me to say that I shall be only too glad if they will do so."

Sir FREDERICK ARROW said he believed the canal to be an unqualified success, a boon to humanity, and a great advantage to the commerce of the world. Looking at it with the eye of a practical seaman, he was sure that there were no difficulties connected with the enterprise which ordinary skill and care and proper appliances could not overcome. A good deal had been said, both before the opening of the canal and since, about the excessively sharp curves in some

parts of it, and about the great difficulty there would be in getting long ships past them. His impression was to the contrary, for he had watched long ships going around them. As they approached the difficulties they all seemed to vanish, and the truth was that the curves were not so very excessive. With ordinary care on the part of the helmsmen and those in control of the ship, there would be no difficulty in getting round any of them. It was quite true that in some places there were obstructions in the course of the canal; for while the greater part of it attained a maximum depth of twenty-six or twenty-seven feet of water, there were certain ridges, some of sand, some of rock, where the depth was only from eighteen to nineteen feet. There would, however, be no great difficulty in ultimately getting rid of those obstructions. He believed that in some places the depth was diminished by the filtration of water through the banks bringing down sand to the bottom. That could easily be removed. It was simply a matter of labour and of time, and, above all, of money, to remove the obstruction at Serapeum. He did not think that anything like the sum of 2,000,000*l.* would be required to make the canal easily navigable for the trade which was likely for some years to pass through it. When there was a uniform depth of twenty-three or twenty-four feet, which he believed would be sufficient, the canal would be of great advantage to the commerce of this country and of the whole world. It was not necessary that there should be an excessive depth of twenty-seven feet; for, by the simple process of lightening and trimming vessels, there would be no great difficulty in getting them through. Vessels of great tonnage and length had already passed through, and he believed one of four hundred feet, fully justifying what he had said when he was there, that he saw no earthly reason why a vessel of four hundred feet should not go through. He took a more sanguine view of the results of the opening of the canal than Lord Houghton did. He believed that the canal was destined to be the great channel of communication between the whole of India west of Cape Comorin and Europe. The trade of the Persian Gulf and parts of Arabia and Asia, which at present were not within the realms of commerce, would be developed. The railway systems of India bringing down the cotton of the Deccan and the products of vast fields of labour of Central India, would all converge upon Bombay, which appears to be the natural point of departure for the Suez Canal. Besides this, all the trade of the North-West which came by the Indus would find its outlet to Europe through the canal. He believed that its commerce would be more and more developed daily, and it was his sincere and earnest hope that the shipowners of this country would take advantage of the opportunity and make the best of it. With our unequalled powers of shipbuilding, it would be the fault of our own country if we did not reap the greatest benefit from the opening of the canal. It was perfectly true that a considerable commerce would go to the Adriatic and to the Levant, and to the Eastern Archipelago, but there was a still larger commerce to be developed. It was probable that even goods and materials bound for Northern Europe would pass through the canal and through the Mediterranean. Beyond that a very large field was opened in the Black Sea. Russia was making great endeavours to foster her trade and manufactures, and vessels might pass from Bombay laden with cotton through the canal, the Dardanelles, and the Bosphorus, and land their goods at the mouths of the Danube and at Odessa. He trusted that England would seize upon the opportunity and become carriers of that trade. English shipowners need have no fear whatever about the result. As railways have created traffic, so the canal would create traffic also; and as commerce increased, so the wants of mankind would be multiplied, and employment would be found both for the canal and for the route of Vasco de Gama around the Cape. As one ship after another passed through the canal and discovered the facilities which it afforded, so more and more would the attention of our merchants and shipowners be called to it,

and it would be the high road to the East, bringing the products of the East in their old channel through Arabia to the ports of Europe. There was not the smallest necessity for our own trade to suffer. Our entrepôt trade might be to some extent perhaps damaged, but that would be more than made up by the increase of communication and the growth of commerce.

SIR BARTLE FRERE said, up to the time when he traversed the unfinished works of the Suez Canal, a little more than two years ago, he had been a sceptic as to the possibility of completing it, and as to the probability of its being of much benefit to the great commerce between Europe and India; but he then came to the conclusion that it was likely to be quite as valuable to England, and to the bulky commerce which Englishmen carried on with India, as to the smaller commerce which must inevitably fall into the hands of those who were nearest to the canal. Even at that time the canal had reduced the price of coals at Suez some 16s. per ton. A very large proportion of the cotton which came to England from India was formerly brought by steamers through the Red Sea, then sent by railway to Alexandria, and again by steamers through the Mediterranean. This, of course, was a very expensive route, and the reduction of the expense, by sending the cotton in one ship through the canal, must lead to a very large increase in the trade. Traffic in many other articles would also be benefited. The mere fact that the canal would enable them to place a chest of indigo on board a ship in Calcutta or Bombay, and not have it moved again until it was taken out in London or Liverpool, was quite sufficient to show the great value of the new route. The great risk of breaking fragile articles would also be avoided. There would be no necessity to throw them about from one place to another, to remove them from the ship to the lighter, from the lighter to a railway-truck, from the railway-truck again to the lighter, and from the lighter to the ship on the other side. The absence of all this shaking and knocking about was of very great importance, not only with regard to the preservation, but also with regard to the expense of the articles. He had, therefore, come to the conclusion that the Suez Canal would be of the utmost importance to the great trade of India. One thing worthy of special notice was the immense results which had been produced by the use of mechanical engineering. This had a very remarkable bearing upon the connexion of Lord Palmerston with the work. One of the conditions upon which the great French engineers first set about the work was that they should be supplied with free labour—that the labourers should be made to work, as they did at the Pyramids, for a very small, and hardly sufficient ration of food. Of course such a plan would involve a very serious loss of life. Tens of thousands of lives were lost in the formation of the great canal between Alexandria and the Nile. This, almost as much as the territorial question, influenced Lord Palmerston. His whole life had been devoted to the suppression of slavery throughout the world; and he felt that it would not be becoming in him to be applying all his energies and all the resources of this country to putting down slavery elsewhere, while allowing it to grow up under his very feet on the Isthmus of Suez. It was this that led him to say that England never could consent to have the canal made in such a way. M. de Lesseps generously said to him (Sir Bartle Frere) that he felt it was to that resolution of Lord Palmerston that he owed the success of the enterprise, because he was thereby led to consider how he could make the canal with free labour, and so he turned his very great mind to the appliances of mechanical engineering. He said also that he found on the banks of the Thames, and the Clyde, and the Mersey, those appliances already at work in the great dredges by which those rivers are kept clear and improved. And it was by improvement upon those dredges that the French engineers were able to do their work in about half the time, and at about half the expense which the labours of the fellahs of Egypt would have

taken. This was a fact which ought to be remembered to the honour of Lord Palmerston.

Mr. FOWLER said, although he was unable to accept the invitation of the Khedive to be present at the opening of the canal, he was there about twelve months ago, and saw the works in progress. The wonderful dredges, of which so much had been said and written, were then at work, and there could be no doubt that to those dredges was due the fact that at this moment the canal was finished. M. de Lesseps, as was generally known, was not himself an engineer; but among the able engineers whom he collected about him was Mr. Lavelley, who, although a contractor by practice, was an engineer by education. Messrs. Borel and Lavelley were the contractors for the Suez Canal. Mr. Lavelley's early technical education was commenced and completed in France, but his practical education was commenced and completed in England. For many years he was in the best mechanical establishments of this country. He was thus well prepared to accept the contract for such an undertaking as the Suez Canal, where he found it necessary to invent and adapt mechanical appliances of various kinds; the dredges in use in the canal were totally different from those which had previously been used, and were of three kinds; the most remarkable being those which took up the excavation from the centre of the canal, and conveyed it in a semi-fluid state to a distance of 70 or 80 yards by means of suspended iron-work. Those machines were invented or adapted almost entirely by Mr. Lavelley, and were constructed in England, in Belgium, and in France. It was such machines as these which had enabled M. de Lesseps to complete the canal in half the time, and at half the expense which would have been necessary if they had attempted to execute the work by the poor fellahs of Egypt. The difficulties of constructing the canal were principally four—viz., those at the entrance to Port Said; the supposed blowing of the sand of the desert into the canal; the washing away of the slopes; and the difficulty caused by the great evaporation of the vast expanse of the Bitter Lakes. The difficulties at Port Said arose from the alluvium brought down by the Nile, and taken along the coast towards the Bay of Pelusium; this was arrested by the works, and deposited in the harbour. Although, no doubt, this was a considerable difficulty, it was not one which was insurmountable. The effect of the washing of the slopes was a matter which experience only could settle, and would be readily met by works of protection. Many erroneous notions were prevalent as to the extent to which the canal was liable to be choked with the sand blown from the desert. A very large portion of the canal was through water. Lake Mensaleh occupied a considerable portion of the distance, and, of course, no sand could blow into the canal from the sides in that part of it. The Bitter Lakes and Lake Timsah also occupied a considerable distance, and therefore the portion liable to be acted upon by the sand was very short as compared with the total length of the canal. Those who constructed the canal were quite aware of the difficulty, and had tried various means of limiting it. By means of plants supplied with fresh water from the fresh-water canal, they were creating an oasis on each side of the canal, so as to throw back the desert, and thereby greatly diminish the quantity of sand brought into the water. During twelve months the quantity blown into the canal was 200,000 cubic metres; and this would be constantly diminishing by the operations of the fresh-water canal; it is well known that wherever any portion of the land of Egypt was watered it was productive, and generally yielded a profit. He therefore thought that the blowing of the sand, which at one time was supposed to be an insuperable difficulty, was really one of the smallest difficulties. With respect to the question of evaporation; the Bitter Lakes occupied about 100,000 acres, and the evaporation was very considerable, amounting to about 250,000,000 cubic feet daily. All that vast quantity must be supplied from the Red Sea and the

Mediterranean, but chiefly from the Red Sea. This would require a velocity of about $1\frac{1}{2}$ mile per hour from the Red Sea to supply the waste. In the Red Sea the spring tides rise 6 feet, the neap tides 2, and it was expected by some persons that the current from the Red Sea into the Bitter Lakes would be so rapid as to make it an impossibility for vessels to work against it. Such had not been found to be the case, although there must be a considerable indraught over and above the flow of the tide in order to supply the evaporation. The Bitter Lakes were formerly a part of the sea, and being cut off either by natural or artificial means, the evaporation went on until, in the course of a very long period, only a residuum of salt was left. When the water was first let in to the land, which formed a depression of the desert, the salt was in some places 90 feet thick. That had been gradually dissolved, and might now be said to form a part of the Red Sea or the Mediterranean. He entirely agreed with Sir F. Arrow and Sir Bartle Frere in their estimate of the advantages that would result from the opening of communication to India by means of the canal.

Mr. WYLLIE reminded the meeting that the canal would but restore the Indian traffic to its old route. Up to the discovery of the Cape of Good Hope the Red Sea formed the main channel of commercial communication between Europe and Asia; and the ancient rulers of Egypt were fully alive to the importance of establishing a continuous passage by water between the Red and the Mediterranean seas. The grand difference between all the ancient projects and the present one was that formerly the idea had always been not to cut right across the isthmus, but to connect the Red Sea with the Nile. That scheme had been carried out. The fresh-water canal, which gave life and sustenance to the maritime canal, was merely a revival of what was done by the Pharaohs and the Ptolemies, and still earlier princes. From the days of Sesostris down to the early centuries of the Christian era history teems with references to the existence of the institution and to its maintenance by successive operations of repair and new excavation. To give a familiar instance, in the days of Cleopatra the canal was in such a state of preservation that after the battle of Actium that princess had ideas of escaping down to the Red Sea with her lover by that means.

The PRESIDENT having thanked Lord Houghton for his address, the meeting was adjourned to January 24th.

Fifth Meeting, January 24, 1870.

SIR RODERICK I. MURCHISON, BART., K.C.B., PRESIDENT, in the Chair.

PRESENTATIONS.—*R. V. Boyle, Esq.; Henry Cook, Esq., M.D.; Robert Clark, Esq.; William Nicholas, Esq.; James S. Wichelow, Esq.; Alfred Müller, Esq.; Charles W. C. Hutton, Esq.; Lieut. J. Casberd Boteler, R.N.; Lieut.-Colonel H. L. Evans; J. L. Palmer, Esq., Surgeon R.N.*

ELECTIONS.—*Robert George Clements, Esq.; George Dallas, Esq.; Robert Davenport, Esq.; Lieut.-Colonel Henry L. Evans (late Bombay Army); Edward M. Hopkins, Esq.; T. Scarborough Johnson, Esq.; Frederic Lassetter, Esq.; Alexander Lawrence, Esq.; Arthur Laing,*